

# Knowledge and attitude towards contact lenses among female students of Northern Border University, Saudi Arabia

Attitude towards contact lenses

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## Abstract

**Aim:** In this study, we aimed to assess attitudes and knowledge of contact lenses (CL) among female students from Northern Border University (NBU) of Saudi Arabia.

**Material and Methods:** This questionnaire-based survey was conducted on 392 undergraduate female students from five colleges of NBU. Their ages ranged from 18 to 27 years, with a mean age of 23.7±5.3 years. Participants who did not provide a completely filled questionnaire were excluded from this study.

**Results:** In our study, a positive attitude towards CL was found in 72.7% of participants, and sufficient knowledge about CL was shown by 64% of participants. The faculties, personal history of refractive error (RE), or personal history of CL wearing had significantly influenced both the knowledge and the attitude of the participants towards CL. Only 254 (64.7%) of all participants reported that they had tried CL at least once during their life. Among the participants with a history of CL wearing, 72.4% had used CL for both RE and cosmetic purposes, and 71.2% revealed that they were satisfied with their CL use. Comfort was cited by 64.5% of CL wearers to be the main reason for their CL choice. Soft and monthly disposable CLs were the most popular among our participants. The most common CL-related complication in our study was red eyes in 39% of cases. To overcome the complications caused by CL, 62.6% of CL wearers reported that they discontinued using CL without further treatment, 28% had opted for self-medication after removal of CL, while only 16.9% reported that they preferred to consult an ophthalmologist for any CL-related complication. CL sellers were the main source (32.9% of participants) with a limited role of ophthalmologists and optometrists (13.5% of participants) in the source of their CL-related knowledge.

**Discussion:** Despite the positive attitude and overall good knowledge demonstrated by the majority of the NBU female undergraduates, knowledge related to particular aspects like cleaning of CL and the use of CL in active inflammation/infection was found to be unsatisfactory. More ocular health education sessions with the active role of ophthalmologists and optometrists need to be focused on to increase awareness in these areas.

## Keywords

Contact Lens; Complication; Knowledge; Northern Border University; Saudi Arabia

DOI: 10.4328/ACAM.20606 Received: 2021-03-19 Accepted: 2021-05-18 Published Online: 2021-06-06 Printed: 2021-09-15 Ann Clin Anal Med 2021;12(Suppl 4): S399-403

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## Introduction

Contact lenses (CL) are optical devices in immediate contact with the cornea of the eye. The quality of the optical image provided by CL is superior to the image viewed through the eye glasses, and they also eliminate the cosmetic disadvantage of thick eyeglasses in severe ametropia [1]. CL can be aimed at improving the visual acuity when this cannot be achieved by spectacles in conditions like irregular astigmatism associated with keratoconus, corneal irregularities and anisometropia [2-5].

The use of CL is gaining more popularity in view of the availability of a wide range of choices, not only in terms of the lens type and materials alone, but also the increased availability at a large number of locations in the country at a much lower cost compared to the past [3]. Many studies have confirmed that CL usage is becoming more popular, especially among young females [4-6].

Although CL offer many advantages over spectacles, such as more natural appearance and unrestricted field of vision, they need extra care in their handling and maintenance. CL can cause mild complications like redness, ocular discomfort, etc., but some complications, such as microbial keratitis caused by CL, may be potentially vision-threatening [7-8]. Complications may be associated with the knowledge and attitude of the CL wearer.

Knowledge and careful practice of CL wearing can help in preventing complications that may arise from inappropriate use of CL. Although some studies pertaining to the behavior of CL users have been conducted in parts of Saudi Arabia [9-10], there is no such data available from the Northern Border Region of this country. Therefore, this study was taken up to assess the attitude and knowledge of CL among female students from Northern Border University through a predesigned questionnaire.

## Material and Methods

### Study design

This non-funded research project was approved by the Local Committee of Bioethics, Northern Border University on 05/05/2019 under decision No: 37/40/H. The current study was a cross-sectional, questionnaire-based study on the attitude and knowledge of CL among female students of NBU, Saudi Arabia. The questionnaire papers were distributed randomly to the female students of the different faculties of the university. The predesigned questionnaire contained five parts. The first part covered the demographic data of the participants, including age, marital status, college name, academic year, family and personal history of RE, and the use of CL. The second part included 6 questions regarding the attitudes of the participants towards CL, while the third part was composed of ten true and false awareness questions about CL. The fourth part was designed to evaluate the personal experience of CL users among the participants. The last section of the questionnaire was aimed at knowing the main source of knowledge about CL among all participants. The questionnaire was validated by the staff members of the Ophthalmology department of NBU. Only those forms that were completed in all respects were included in the current study.

## Data Analysis

The demographic and perception data were collected and analyzed as numbers and percentages. For the attitude question, "yes" answers were scored as 1, while "no" answers were recorded as zero. Participants who scored more than three were considered to have a positive attitude towards CL. While the participants who scored below three were considered to have a negative attitude towards CL. For knowledge questions, correct answers were scored as one, while the wrong answers were scored as zero. The participants who had scored five or more were considered to have sufficient knowledge, while the participants with scores below five were considered to have insufficient knowledge about the CL. The effect of the different variables of the demographic data on the overall scores was analyzed using the Mann-Whitney test. Significance was considered with a P-value of less than 0.05.

## Results

After receiving informed consent, 392 female students from NBU returned completely filled forms to the data collectors. Their ages ranged from 18 to 27 years, with a mean age of  $23.7 \pm 5.3$  years. The whole collected demographic data of the studied participants are shown in Table 1.

Regarding the participants' attitude towards the CL, 285 (72.7%) showed a positive attitude with an overall score geometric mean of 4.8 (95% confidence interval: 4.4-5.3) ranging from 3 to 6 points. Answers of the participants to the attitude questions according to their own beliefs are shown in Table 2. The faculties, personal history of RE, or personal history of CL use significantly affected the attitude of the participants towards CL (P-value=0.034, 0.012, and 0.008, respectively) (Figure 1).

Sufficient knowledge about CL was shown by 251 (64%) participants with an overall score geometric mean of 7.7 (95% confidence interval: 7.1-8.3) ranging from 4 to 10 points. The summary of the right answers is shown in Table 3. The faculties, personal history of RE, or personal history of CL wearing significantly affected the attitude of the participants towards CL (P-value=0.034, 0.025, and 0.018, respectively) (Figure 2).

Only 254 of the participants (64.7%) reported that they had used CL at least once during their life. Regarding the personal experience about CL among the participants with a history of CL wearing (at least once during their life), 184/254 (72.4%) used CL for both RE and cosmetic purpose, while only 30 and 40 users reported that they have used CL for RE or cosmetic reasons, respectively. Among CL wearers, 181 (71.2%) revealed that they were satisfied with their CL and felt comfortable with the CL use. The main reason for their choice for CL was a comfort as reported by 164 (64.5%) CL users, which is more prioritized for them than the brands or ease of maintenance. Soft CL was the most common type used by 154 (60.6%) CL users. The semisoft, hard and rigid gas permeable lenses were used by 44 (17.3%), 42 (16.5%) and 14 (5.5%) CL users, respectively. The most popular modality was the monthly disposable contact lens, used by 87 (34.3%) CL users. Daily, weekly, bi-weekly and quarterly disposable were used by 64 (25.2%), 46 (18.1%), and 21 (8.3%) CL users, respectively. Only 15 (5.9%) CL users opted for the bi-annual replacement modality.

Regarding CL complications among participants, the red eye was the commonest [99 (39%)], while 15% of CL users did not report any complications for CL. (Fig. 3a). The response of the participants to CL complications was variable; 159 (62.6%) reported that they would just remove CL without further treatment, 71 (28%) reported that they may use self-medications after removal of CL, while only 43 (16.9%) reported that they opted to consult an ophthalmologist for any CL complication. The majority of the participants reported the CL sellers as the main source of knowledge about CL, with limited role of ophthalmologists and optometrists in the source of their knowledge (Figure 3b).

**Table 1.** Demographic data of the participants

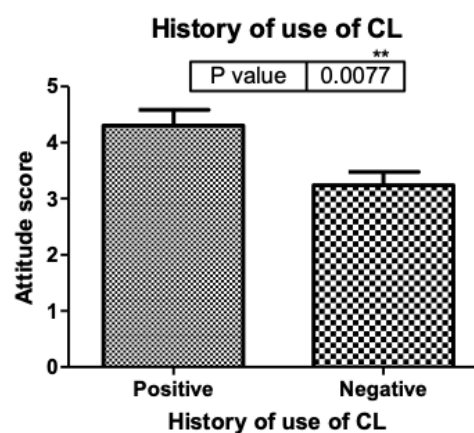
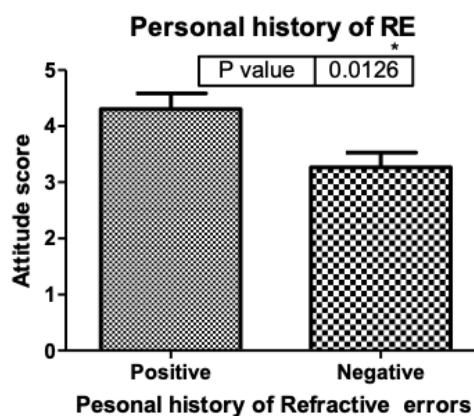
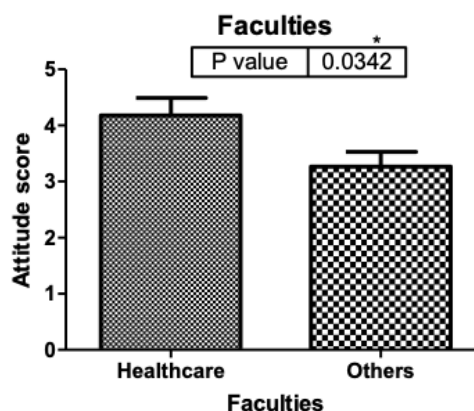
Demographic data	N	%	Total n (%)
<b>Ages</b>			
18- 22	326	83.2	392(100)
23-27	56	14.3	392(100)
28 or above	10	2.6	392(100)
<b>Marital status</b>			
Single	331	84.4	392(100)
Married	61	15.6	392(100)
<b>Faculties</b>			
Education	93	23.7	392(100)
Applied Medical Sciences	182	46.5	392(100)
Medicine	58	14.7	392(100)
Arts	47	12	392(100)
Business Administration	12	3.1	392(100)
<b>Academic year</b>			
First Year	163	41.6	392(100)
Second Year	108	27.6	392(100)
Third Year	74	18.9	392(100)
Fourth Year	12	3.1	392(100)
Fifth Year	14	3.6	392(100)
Sixth Year	6	1.5	392(100)
Internship	15	3.8	392(100)
<b>Family history of RE</b>			
Yes	217	55.4	392(100)
No	175	44.6	392(100)
<b>Personal history of RE</b>			
Yes	153	39.0	392(100)
No	239	61.0	392(100)
<b>History of use of CL</b>			
Yes	254	64.8	392(100)
No	138	35.2	392(100)

**Table 2.** Participants' attitude towards CL

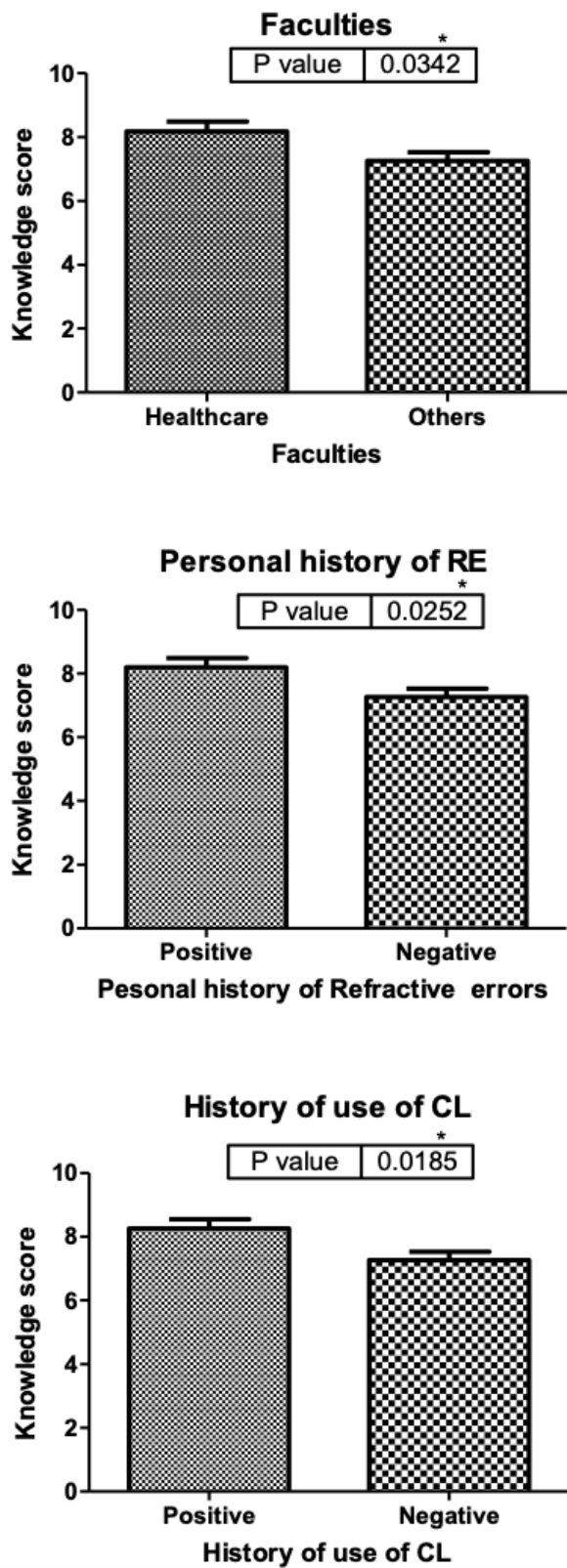
Attitude statements	Yes		No		Total n (%)
	N	%	n	%	
I prefer CL over glasses.	265	67.6	127	32.4	392(100)
I feel CL gives better cosmetic results.	302	77	90	23	392(100)
I expect better visual acuity with CL.	225	57.4	167	42.6	392(100)
I feel CL is more appropriate for daily life activities.	287	73.2	105	26.8	392(100)
I feel CL is socially more acceptable than glasses.	312	79.6	80	20.4	392(100)
I believe CL benefits are more than its disadvantages.	235	59.9	157	40	392(100)

**Table 3.** Participants' knowledge about CL

Knowledge statements	Yes		No		Total n (%)
	N	%	n	%	
CL good hygiene is important.	312	79.6	80	20.4	392(100)
CL can be worn while swimming.	115	29.3	277	70.7	392(100)
CL can be cleaned with water.	201	51.3	191	48.7	392(100)
CL can be worn beyond expiry date.	57	14.5	335	85.5	392(100)
CL can be exchanged with another person	102	26.0	290	74.0	392(100)
CL can cause complications if not handled properly.	279	71.2	113	28.8	392(100)
CL can be used in active inflammation/ infection of the eye.	187	47.7	205	52.3	392(100)
CL can be used for cosmetic purposes.	315	80.4	77	19.6	392(100)
CL can be used for therapeutic purposes.	353	90.1	39	9.9	392(100)
CL can be soft, semisoft, hard or rigid.	273	69.6	119	30.3	392(100)



**Figure 1.** Effect of the faculties, personal history of RE or CL on the participants' attitude towards CL

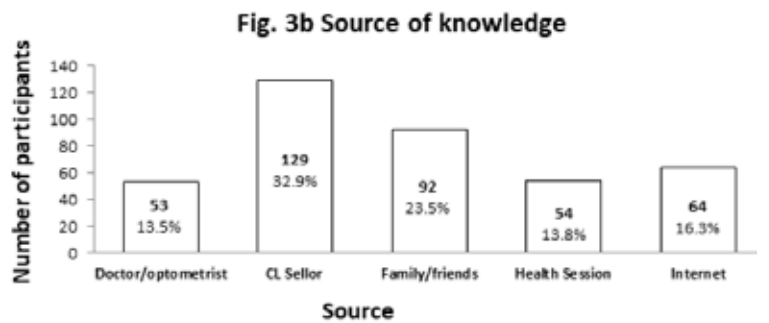
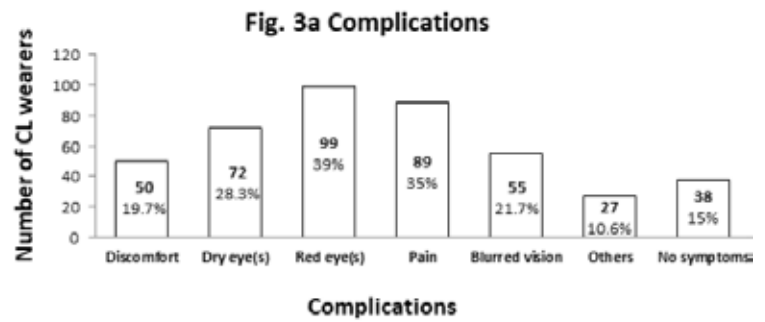


**Figure 2.** Effect of the faculties, personal history of RE or CL on the participants' knowledge about CL

**Discussion**

The contact lens (CL)-related attitude and knowledge among 392 undergraduate female students from five colleges of NBU of Saudi Arabia was assessed through a structured questionnaire.

In our study, a positive attitude towards CL was found in 72.7% of participants. This is in line with a study conducted in Thailand in which 75% of the participants had a moderate attitude level



**Figure 3.** (a) Complications experienced by CL wearers and (b) Source of knowledge among all participants

about contact lens use and good practice level about the proper contact lens use and care [11].

Regarding the knowledge related to CL, 64% of our participants showed that they have sufficient knowledge about CL. Similarly, 54.7% of Saudi urban CL users were found to have an excellent level of knowledge regarding CL [9].

The faculties, personal history of RE, or personal history of CL wearing had significantly influenced the attitude and as well as the CL-related knowledge of the participants. This is because the students from health sciences are expected to have more awareness about contact lenses than other faculties.

Although the participants of this study demonstrated generally sufficient knowledge about the CL, 51.3% of the participants thought that CL can be cleaned with water, and 47.7% participants thought that the use of CL during active inflammation/infection was acceptable. These are some serious concerns which need to be addressed through educational sessions. These percentages are lower than the results of a recent study conducted on female university students in eastern Saudi Arabia [12]. In their study, 59.1% of the participants knew that any active inflammation/infection was a contraindication for the CL use, and 54.6% of the participants were aware that cleaning of CL with water would cause infection. These variations maybe because of the differences in the sources of knowledge for CL, as in their study, the main source was a doctor or optometrist, while as in our study, it was mainly the CL sellers.

In our study, 64.7% of the participants reported that they had used CL at least once during their life. This is higher than the rate (50.2%) reported among medical students from King Abdulaziz University, Jeddah, Saudi Arabia [10]. This difference may be because all colleges of the university were included in our study.

The current study revealed that 72.4% of the participants

used CL for both RE and cosmetic purposes. Soft and monthly disposable CL were the most popular among our participants. Among CL wearers, 71.2% revealed that they were satisfied with their CL and the main reason for their CL choice was comfort, as cited by 64.5% of CL users. The same is noted in a study conducted in India, where the majority of medical college students were using soft contact lenses as they are more comfortable and better tolerated [13].

Red eyes were the most common reported CL complications, [99 participants (39%)]. Likewise, the acute red eye was the commonest CL complication reported in another study conducted in Jeddah Saudi Arabia [10].

To overcome the complications caused by CL, 62.6% reported that they just removed CL without further treatment, 28% reported that they could use self-medications after removal of CL, while only 16.9% reported that they opted to consult an ophthalmologist for any CL complication. This is slightly lower than what is indicated in a study at King Abdulaziz University, Jeddah, Saudi Arabia. In their study 55.5% of the female medical college students would discontinue their CL until symptoms resolved, and only 23.2% would seek medical help and consulted a doctor for treatment [14]. These small differences may be due to the fact that only university medical students were included in their study.

CL sellers were the main source of knowledge about CL with the limited role of ophthalmologists and optometrists in the source of their knowledge. This is supported by a study conducted in Madinah Saudi Arabia in which 75.9% of the participants mentioned that they buy contact lenses at optical shops, 19.8% at cosmetic centers and only 4.3% at hospitals [15]. Similarly, another study from Riyadh, Saudi Arabia also reported that the main purchasing locations for CL were optical shops (51%), beauty salons (38%) and pharmacies (11%) [16]. However, this is in contradiction to other study conducted in Turkey, where the most common source of CL use education was ophthalmologists (55.5% of the participants), followed by opticians (28.2%) [17]. This may be due to different health care systems in different countries.

### Conclusion

Although a positive attitude towards contact lenses and overall good knowledge was demonstrated by the majority of female undergraduates, there is still insufficiency in the knowledge when particular aspects, such as cleaning of CL and the use of CL in active inflammation/infection are taken into consideration. Therefore, more ocular health education sessions with the active role of ophthalmologists and optometrists need to be focused to increase awareness in these areas.

### Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

### Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

**Funding:** None

### Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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### How to cite this article:

Mujeeb Ur Rehman Parrey, Farhan Khashim Alswailmi, Maram Khalf A Alenzi, Mariam ayiad J Alshammari, Deema Faleh Alanazi, Reema Faleh Alanazi. Knowledge and attitude towards contact lenses among female students of Northern Border University, Saudi Arabia. *Ann Clin Anal Med* 2021;12(Suppl 4): S399-403